

Silicon NPN Phototransistor

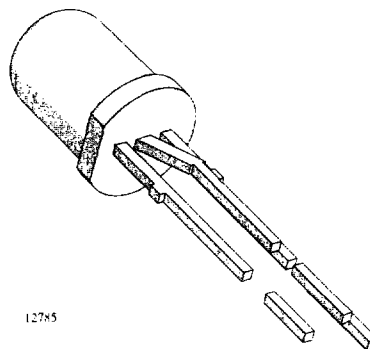
Description

BPV11 is a very high sensitive silicon NPN epitaxial planar phototransistor in a standard T-1 $\frac{1}{4}$ plastic package.

Due to its waterclear epoxy lens the device is sensitive to visible and near infrared radiation.

The viewing angle of $\pm 15^\circ$ makes it insensible to ambient straylight.

A base terminal is available to enable biasing and sensitivity control.



Features

- Very high photo sensitivity
- Standard T-1 $\frac{1}{4}$ (ϕ 5 mm) package with clear lens
- Angle of half sensitivity $\varphi = \pm 15^\circ$
- Base terminal available

Applications

Detector for industrial electronic circuitry, measurement and control

Absolute Maximum Ratings

$T_{amb} = 25^\circ\text{C}$

Parameter	Test Conditions	Symbol	Value	Unit
Collector Base Voltage		V_{CBO}	80	V
Collector Emitter Voltage		V_{CEO}	70	V
Emitter Base Voltage		V_{EBO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	$t_p/T = 0.5, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leq 47^\circ\text{C}$	P_{tot}	150	mW
Junction Temperature		T_j	100	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55...+100	$^\circ\text{C}$
Soldering Temperature	$t \leq 5 \text{ s}, 2 \text{ mm from body}$	T_{sd}	260	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	350	K/W

Basic Characteristics

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	$I_C = 1\text{ mA}$	$V_{(BR)CEO}$	70			V
Collector Dark Current	$V_{CE} = 10\text{ V}, E = 0$	I_{CEO}		1	50	nA
DC Current Gain	$V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, E = 0$	h_{FE}		450		
Collector Emitter Capacitance	$V_{CE} = 0\text{ V}, f = 1\text{ MHz}, E = 0$	C_{CEO}		15		pF
Collector Base Capacitance	$V_{CB} = 0\text{ V}, f = 1\text{ MHz}, E = 0$	C_{CBO}		19		pF
Collector Light Current	$E_c = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$	I_{ca}	3	10		mA
Angle of Half Sensitivity		ϕ		± 15		deg
Wavelength of Peak Sensitivity		λ_p		850		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620..980		nm
Collector Emitter Saturation Voltage	$E_c = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, I_C = 1\text{ mA}$	V_{CEsat}		130	300	mV
Turn-On Time	$V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\Omega$	t_{on}		6		μs
Turn-Off Time	$V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\Omega$	t_{off}		5		μs
Cut-Off Frequency	$V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\Omega$	f_c		110		kHz

Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

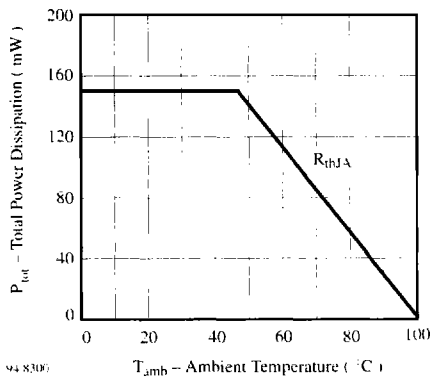


Figure 1. Total Power Dissipation vs. Ambient Temperature

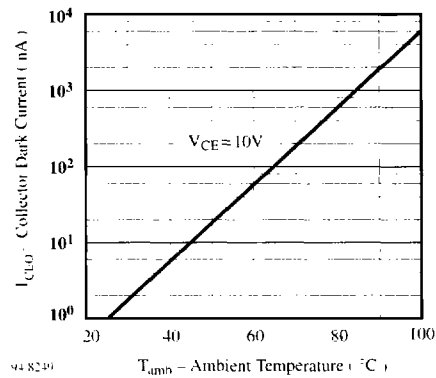


Figure 2. Collector Dark Current vs. Ambient Temperature

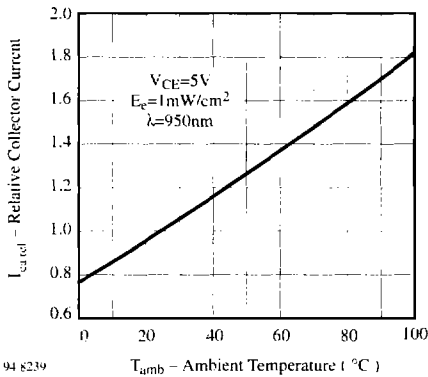


Figure 3. Relative Collector Current vs. Ambient Temperature

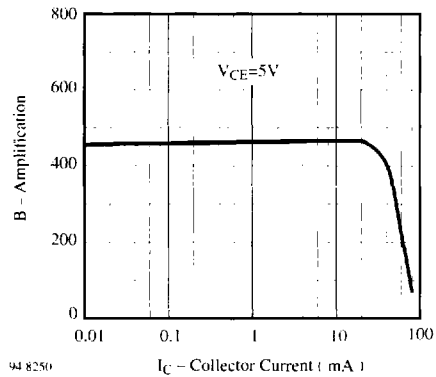


Figure 6. Amplification vs. Collector Current

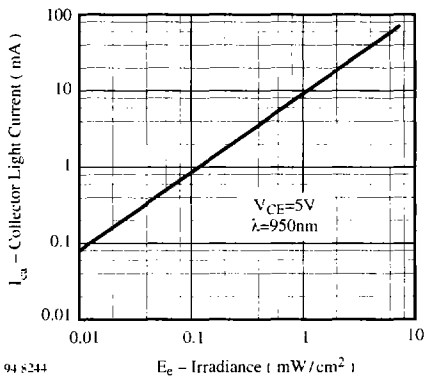


Figure 4. Collector Light Current vs. Irradiance

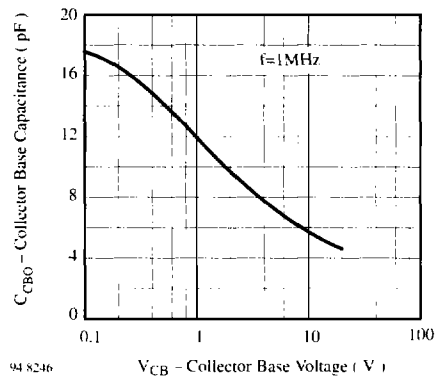


Figure 7. Collector Base Capacitance vs. Collector Base Voltage

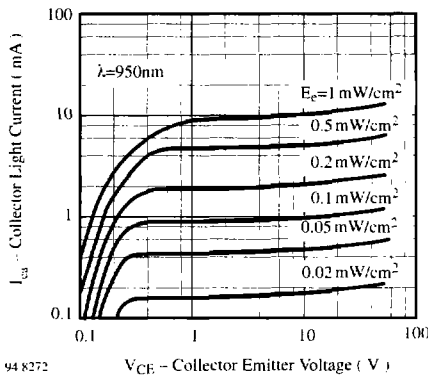


Figure 5. Collector Light Current vs. Collector Emitter Voltage

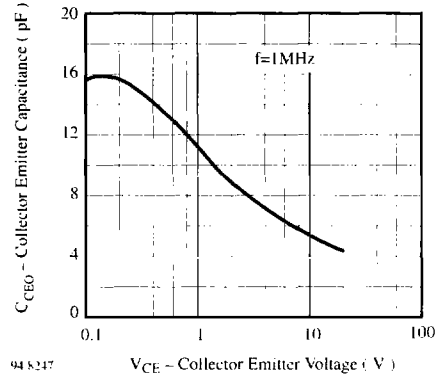


Figure 8. Collector Emitter Capacitance vs. Collector Emitter Voltage

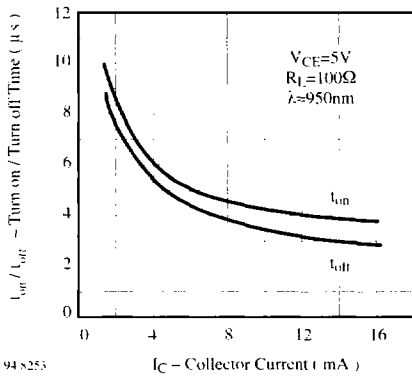


Figure 9. Turn On/Turn Off Time vs. Collector Current

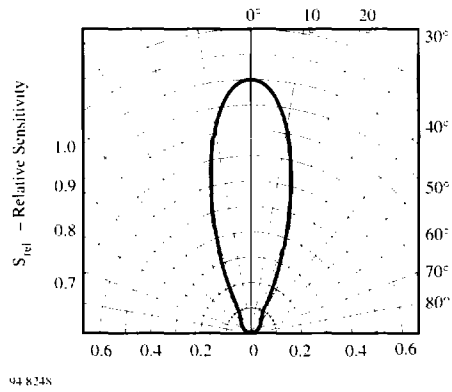


Figure 11. Relative Radiant Sensitivity vs. Angular Displacement

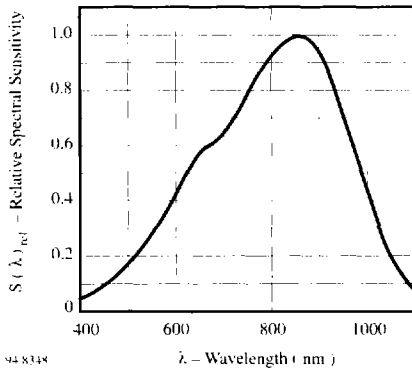


Figure 10. Relative Spectral Sensitivity vs. Wavelength

Dimensions in mm

